

Notice of Allowability

Application No.

10/812,409

Examiner

Rodney G. McDonald

Applicant(s)

BALDWIN ET AL.

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Response filed 8-22-07.
2. ☒ The allowed claim(s) is/are 1-5.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).


* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


RODNEY G. MCDONALD
PRIMARY EXAMINER

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

The application has been amended as follows and is done to update the status of the Applications cited in Applicant's specification:

Page 1, line 9, after the phrase "filed July 22, 2002," insert the phrase "now U.S. Pat. 6,723,209,".

Page 1, line 12, after the phrase "filed May 2, 2002," insert the phrase "now U.S. Pat. 6,679,976,".

The following is an examiner's statement of reasons for allowance:

Claims 1-3 are allowable over the prior art of record because the prior art of record does not teach a system for performing sputter etching comprising an ion source that generates an ion current directed at the substrate; an electron source that generates an electron current directed at the substrate; biasing circuitry that biases the substrate with an a-symmetric bi-polar DC voltage pulse signal, the circuitry being formed from a positive voltage source with respect to ground, a negative voltage source with respect to ground and a high frequency switch; at least one current sensor, coupled to the biasing circuitry, that monitors a positive current and a negative current from the substrate during one or more cycles of the a-symmetric bi-polar DC voltage pulse signal; a controller, coupled to the at least one current sensor, that varies the ion current

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independently from the electron current; wherein the ion and electron sources create a continuous plasma proximate the substrate, and the biasing circuitry causes the substrate to alternatively attract ions and electrons from the plasma; wherein the ions attracted from the plasma sputter etch the substrate; and wherein the electrons attracted from the plasma neutralize accumulated charge on the substrate.

Claims 4-5 are allowable over the prior art of record because the prior art of record does not teach a method for sputter etching comprising generating an ion current directed at a substrate by an ion source; generating an electron current directed at the substrate by an electron source; biasing the substrate with biasing circuitry that generates an a-symmetric bi-polar DC voltage pulse signal, the circuitry being formed from a low voltage source, a high voltage source and a high frequency switch; monitoring, with at least one current sensor coupled to the biasing circuitry, a positive current and a negative current from the substrate during one or more cycles of the a-symmetric bi-polar DC voltage pulse signal; varying, with a controller coupled to the at least one current sensor, the ion current independently from the electron current; wherein the ion and electron sources create a continuous plasma proximate the substrate, and the biasing circuitry causes the substrate to alternatively attract ions and electrons from the plasma; wherein the ions attracted from the plasma sputter etch the substrate; and wherein the electrons attracted from the plasma neutralize accumulated charge on the substrate.

Quazi (U.S. Pat. 4,693,805) the closest prior art of record shows an bipolar DC sputter etching process for etching a substrate. Quazi fail to show an ion source, an

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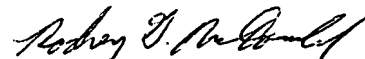
electron source and control means to control the ion current independent from the electron current applied to the substrate.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M-TH with every Friday off..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Rodney G. McDonald
Primary Examiner
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RM
August 28, 2007